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Predicting Multidrug-Resistant Gram-Negative Bacterial Colonization and Associated Infection on Hospital Admission: Methodological Issues

To the Editor—We read with great interest the article titled "Predicting Multidrug-Resistant Gram-Negative Bacterial Colonization and Associated Infection on Hospital Admission" by Tseng et al[1] published in a recent issue of this journal. We would like to congratulate the authors on their valuable work; however, we think some methodological and statistical issues should be considered to avoid misinterpretation.

As shown in the Table 3 of the article, when a predictor meets a univariate criterion of $P < .01$, the predictor is further considered for multivariable analysis. Here, we are concerned that the authors considered a very conservative P value for univariate screening of candidate predictors. They argued that when a conservative P value (eg, <.01 or <.05) is selected in univariate analysis, only the predictors with relatively large effect will be included in the multivariable analysis. In such a situation, the estimated regression coefficients of selected predictors can have bias away from the null,[2,3] which is known as testimation bias.

Considering a liberal P value (eg, <.10 or <.20) in univariable analysis can effectively compensate for testimation bias.[2] In other words, we can be sure that predictors with relatively large effect (eg, $P < .01$) and predictors with relatively small effect (eg, $.10 < P < .20$) can be tested in multivariable analysis after univariate screening with, for example, $P < .20$. In the study,[1] although long-term hemodialysis appear to be an uninteresting predictor for risk of multidrug-resistant gram-negative bacteria (MDR-GNB) colonization in univariable analysis, it may have a significant effect but only in the presence of other predictors.

We acknowledge that the study provides very interesting results, but the estimated associations for predictors of MDR-GNB colonization may be different from those reported in the study due to testimation bias.

ACKNOWLEDGMENTS

Financial support: No financial support was provided relevant to this article.

Potential conflicts of interest: All authors report no conflicts of interest relevant to this article.

Kamyar Mansori;[1,2]
Erfan Ayubi;[3,4]
Saeid Safiri[5]

Affiliations: 1. Social Determinants of Health Research Center, Kurdistan University of Medical Sciences, Sanandaj, Iran; 2. Department of Epidemiology, School of Public Health, Iran University of Medical Sciences, Tehran, Iran; 3. Department of Epidemiology, School of Public Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran; 4. Department of Epidemiology and Biostatistics, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran; 5. Managerial Epidemiology Research Center, Department of Public Health, School of Nursing and Midwifery, Maragheh University of Medical Sciences, Maragheh, Iran.

Address correspondence to Saeid Safiri, Assistant Professor of Epidemiology, Managerial Epidemiology Research Center, Department of Public Health, School of Nursing and Midwifery, Maragheh University of Medical Sciences, Maragheh, Iran (saeidsafiri@gmail.com).

Infect Control Hosp Epidemiol 2018;39:241–241
 0899-823X/2018/3902-0022. DOI: 10.1017/ice.2017.270

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